



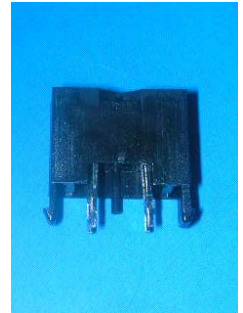
# Technical Data Sheet

## Opto Interrupter

### ITR20002-A

#### ■ Features

- Fast response time
- High analytic
- High sensitivity
- Cut-off visible wavelength  $\lambda_p=940\text{nm}$
- Pb free
- This product itself will remain within RoHS compliant version.



#### ■ Descriptions

The **ITR20002-A** consist of an infrared emitting diode and an NPN silicon phototransistor, encased side-by-side on converging optical axis in a black thermoplastic housing. The phototransistor receives radiation from the IR only . This is the normal situation. But when an reflecting object close to ITR , phototransistor receives the reflecting radiation .For additional component information, please refer to IR4204-10 and PT4204-6B/H26.

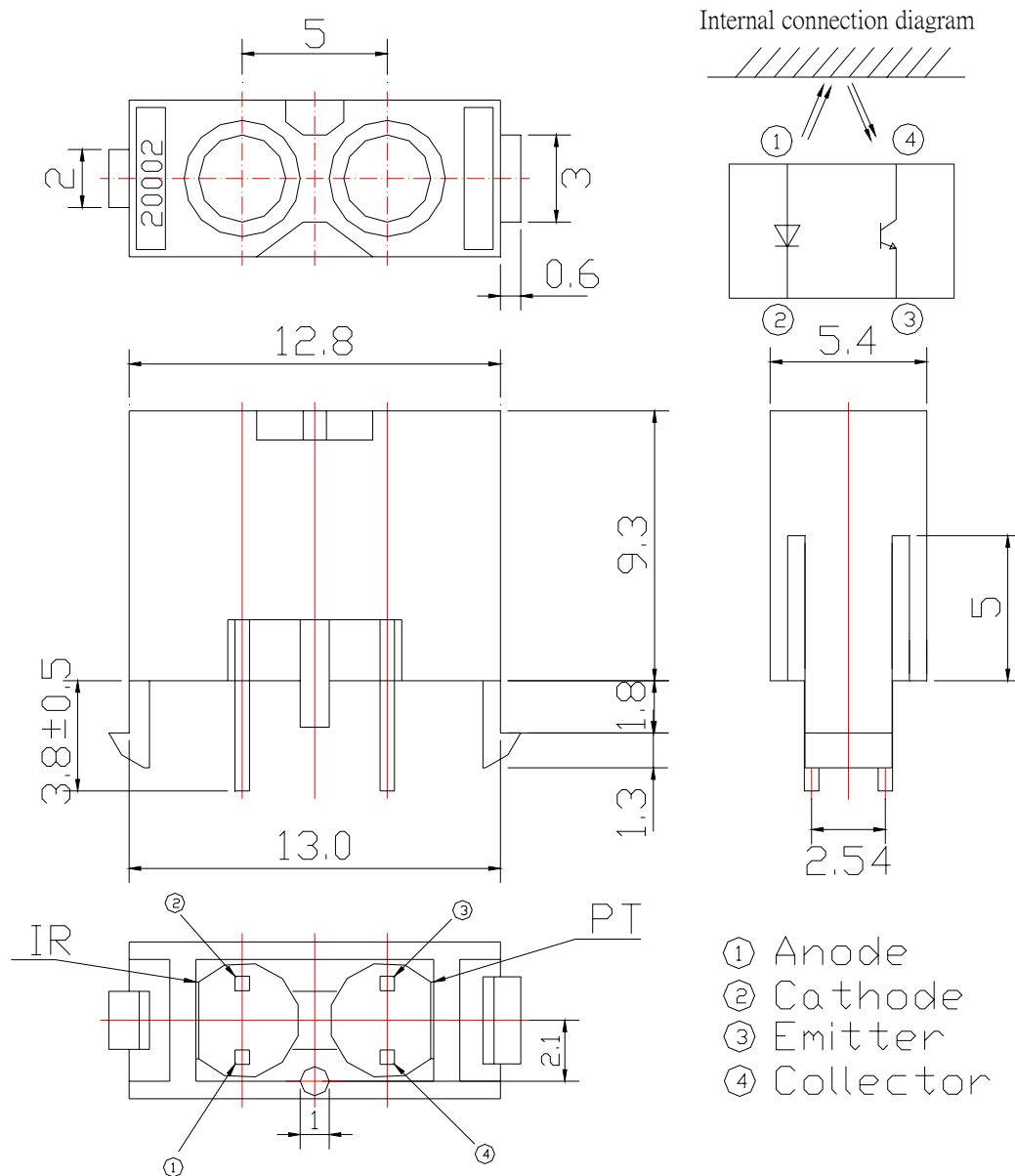
#### ■ Applications

- Mouse Copier
- Switch Scanner
- Floppy disk driver
- Non-contact Switching
- For Direct Board

#### ■ Device Selection Guide

Device No.	Chip Material	LENS COLOR
IR4204-10	GaAlAs	Blue
PT4204-6B/H26	Silicon	Black

## Package Dimensions



1.All dimensions are in millimeters

2.Tolerances unless dimensions  $\pm 0.3\text{mm}$

3.Lead spacing is measured where the lead emerge from the package

## ITR20002-A

### Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Ratings	Unit
Input	Power Dissipation at(or below) 25°C Free Air Temperature	Pd	75	mW
	Reverse Voltage	V <sub>R</sub>	5	V
	Forward Current	I <sub>F</sub>	50	mA
	Peak Forward Current (*1) Pulse width ≤ 100 μs, Duty cycle=1%	I <sub>FP</sub>	1	A
Output	Collector Power Dissipation	P <sub>C</sub>	75	mW
	Collector Current	I <sub>C</sub>	20	mA
	Collector-Emitter Voltage	B V <sub>CEO</sub>	30	V
	Emitter-Collector Voltage	B V <sub>ECO</sub>	5	V
Operating Temperature		T <sub>opr</sub>	-40~+85	°C
Storage Temperature		T <sub>stg</sub>	-40~+85	°C
Lead Soldering Temperature (*2) (1/16 inch form body for 5 seconds)		T <sub>sol</sub>	260	°C

(\*1) tw=100 μsec., T=10 msec.

(\*2) t=5 Sec

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### Electro-Optical Characteristics (Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Input	Forward Voltage	V <sub>F</sub>	-	1.2	1.5	V	I <sub>F</sub> =20mA
	Reverse Current	I <sub>R</sub>	-	-	10	μA	V <sub>R</sub> =5V
	Peak Wavelength	λ <sub>P</sub>	-	940	-	nm	I <sub>F</sub> =20mA
	View Angle	2θ 1/2	-	35	-	Deg	I <sub>F</sub> =20mA
Output	Dark Current	I <sub>CEO</sub>	-	-	100	nA	V <sub>CE</sub> =20V, Ee=0mW/cm <sup>2</sup>
	C-E Saturation Voltage	V <sub>CE(sat)</sub>	-	-	0.4	V	I <sub>C</sub> =0.04mA, I <sub>F</sub> =40mA
Collector Current(*3)		I <sub>C(ON)</sub>	150	-	-	μA	V <sub>CE</sub> =5V, I <sub>F</sub> =20mA
		I <sub>C(OFF)</sub>	-	-	30		
Response Time	Rise Time	t <sub>R</sub>	-	15	-	μs	V <sub>CE</sub> =5V, I <sub>C</sub> =100 μA , R <sub>L</sub> =100Ω
	Fall Time	t <sub>F</sub>	-	15	-	μs	

(\*3) I<sub>C(on)</sub> at the testing condition—with reflector in 6mm away,

I<sub>C(off)</sub> at the testing condition—without reflector and external light less than 10 Lux at the module surface.

# Typical Electrical/Optical/Characteristics Curves for IR

Fig. 1 Forward Current vs. Ambient Temperature

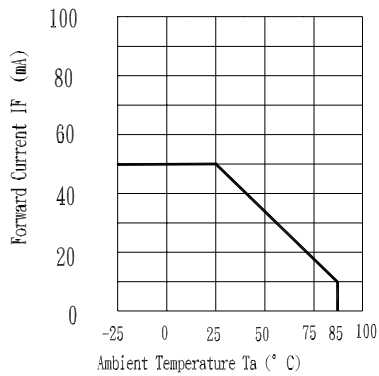


Fig. 2 Spectral Distribution

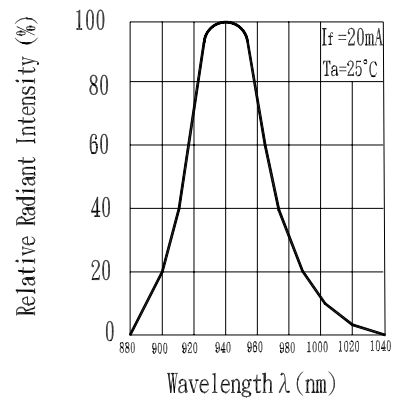


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

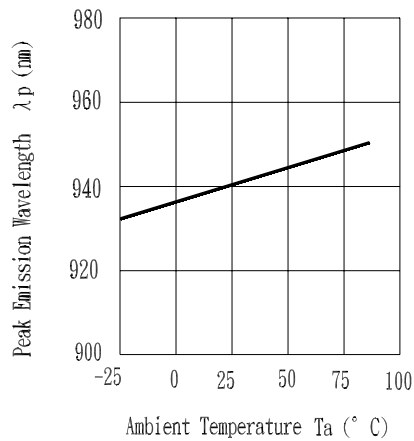


Fig. 4 Forward Current vs. Forward Voltage

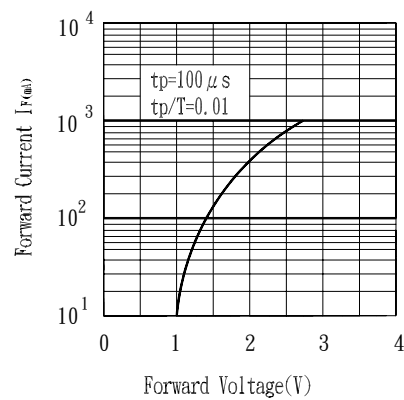


Fig. 5 Relative Intensity vs. Forward Current

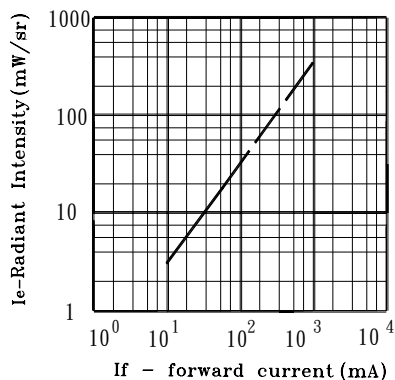
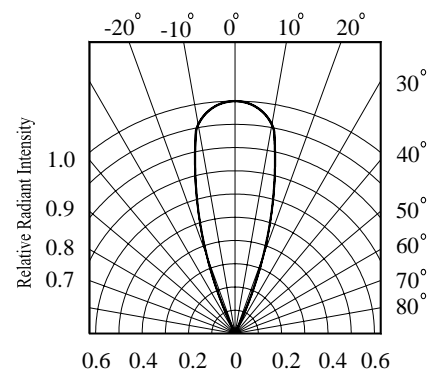


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



# Typical Electrical/Optical/Characteristics Curves for PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

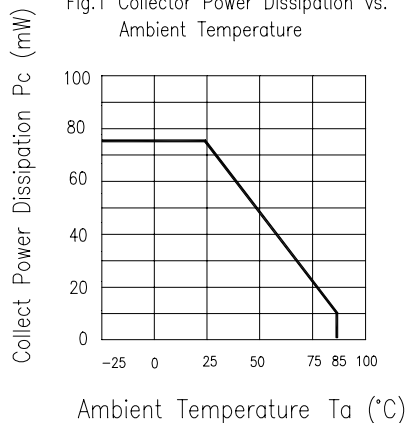


Fig.2 Collector Dark Current vs. Ambient Temperature

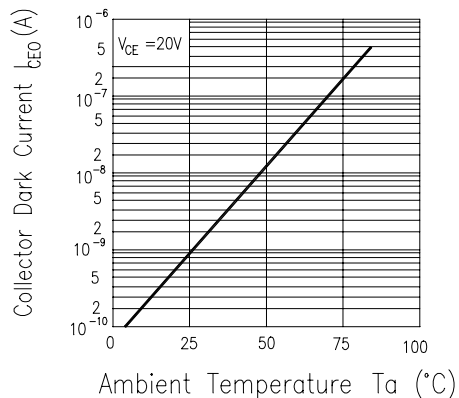


Fig. 3 Relative Collector Current vs. Ambient Temperature

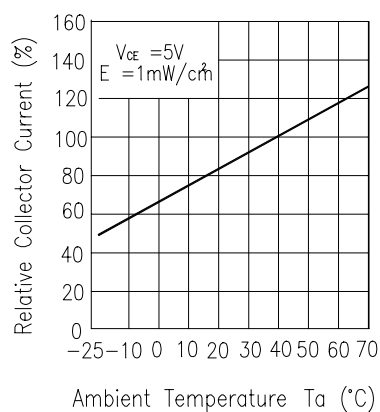


Fig.4 Collector Current vs. Irradiance

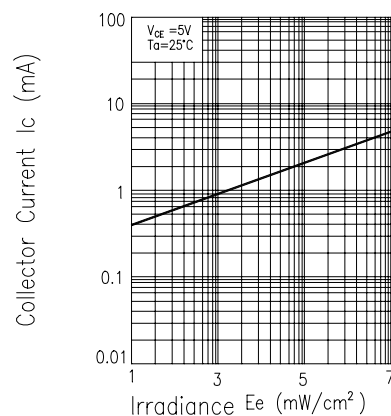


Fig.5 Spectral Sensitivity

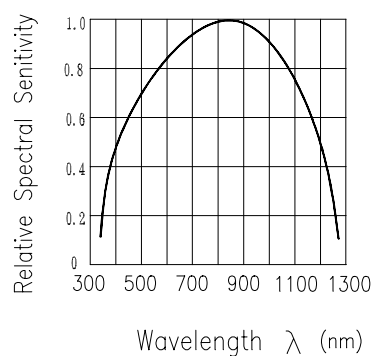
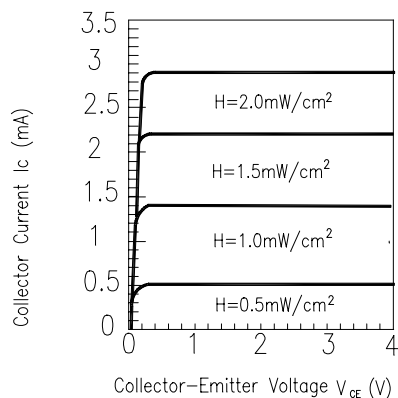


Fig.6 Collector Current vs. Collector-Emitter Voltage



### Reliability Test Item And Condition

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

NO.	Item	Test Condition	Test Hours/ Cycle	Sample Size	Failure Judgement Criteria	Ac/Re
1	Solder Heat	TEMP : 260°C ± 5 °C	5 sec	22 PCs	$I_{c(on)} \leq L \times 0.8$  L :Lower specification limit	0/1
2	Temperature Cycle	H : +100°C    15 mins ↕ 5 min L : -40°C    15 min	300 cycle	22 PCs		0/1
3	Thermal Shock	H : +100°C    5 min ↕ 10 sec L : -10°C    5 min	300 cycle	22 PCs		0/1
4	High Temperature Storage	TEMP. : +100°C	1000 hrs	22 PCs		0/1
5	Low Temperature Storage	TEMP. : -40°C	1000 hrs	22 PCs		0/1
6	DC Operating Life	$V_{CE}=5V$ $I_F=20mA$	1000 hrs	22 PCs		0/1
7	High Temperature / High Humidity	85°C / 85% R.H.	1000 hrs	22 PCs		0/1



## ITR20002-A

### Packing Quantity Specification

- 1.150PCS/1Bag, 5Bag/1Box
2. 10Boxes/1Carton

### Label Form Specification



CPN: Customer's Production Number  
P/N : Production Number  
QTY: Packing Quantity  
CAT: Ranks  
HUE: Peak Wavelength  
REF: Reference  
LOT No: Lot Number

### Notes

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